ATSC/DVB-3/SDI

2U Digital Audio Speaker Monitor

with SDI, AC-3, and AES Inputs on XLR and BNC,
Analog Stereo Output of Selected Source on XLR,
Six 53-Segment Level Meters and Phase Indication

Document P/N 821557 Rev. A

User Manual

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Important Safety Instructions

1) Read these instructions.
2) Keep these instructions.
3) Heed all warnings.
4) Follow all instructions.
5) Do not use this apparatus near water.
6) Clean only with dry cloth.
7) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8) Do not install near any heat source such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10) Protect the power cord from being walked on or pinched, particularly at plugs convenience receptacles and the point where they exit from the apparatus.
11) Only use attachments/accessories specified by the manufacturer.
12) Use only with the cart stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13) Unplug this apparatus during lightning storms or when unused for long periods of time.
14) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as when power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15) Do not expose this apparatus to rain or moisture.
16) The apparatus shall be connected to a mains socket outlet with a protective earthing connection.

CAUTION!

In products featuring an audio amplifier and speakers, the surface at the side of the unit, where the audio amplifier heat sink is internally attached, may get very hot after extended operation. When operating the unit excercise caution when touching this surface and ensure that external materials which may be adversely affected by heat are not in contact with it. There is a Hot Surface label (see diagram) attached to the aforementioned surface of the product.

Introduction

Congratulations on your selection of a Wohler Technologies product. We are confident it represents the best performance and value available, and we guarantee your satisfaction with it.

If you have questions or comments you may contact us at:

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Section 1

General Features and Specifications

Description
Features
Applications
Specifications
Other Options

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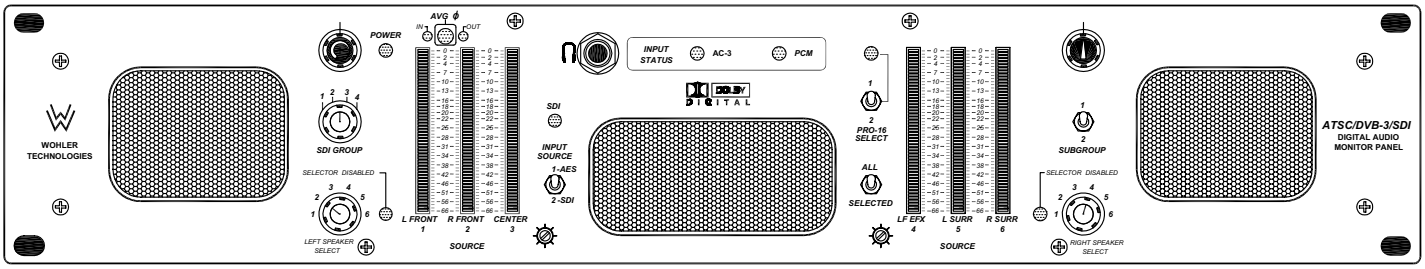
ATSC/DVB-3/SDI

2U Stereo Digiotal Audio Speaker Monitor



ATSC/DVB-3/SDI Front Panel

Description

The **ATSC/DVB-3/SDI** is a powered stereo monitor designed specifically for flexible, comprehensive monitoring of the six audio channels associated with ATSC/DVB programming. The unit is 2RU in size, for excellent fidelity without using excessive rackspace in the critical "operating zone" of rack bays and consoles.

The **ATSC/DVB-3/SDI** monitors **SDI** (Serial Digital Interface), **PCM** (Pulse Code Modulation), **AES/EBU,** and **AC-3** (Dolby Digital®) signals providing capabilities to handle monitoring requirements throughout the facility.

The speakers and amplifiers are arranged in the popular Wohler “biamp summed bass stereo” configuration: bass frequencies from ALL selected channels are summed into a 20 watt amplifier, which drives the woofer. The two side channel amplifiers and speakers reproduce, in stereo, only the mid- and high-frequencies. Note that the center speaker (the woofer) is NOT a dedicated **Center** nor **LFE** speaker. There is also a headphone output, which mutes the speakers while in use.

Six high-resolution wide-range LED bargraph level meters are provided for all six channels for very accurate metering. Fifty-three bi-color segments spanning a range of 65 dB simultaneously display signal levels according to both the **PPM** and **VU** standards. An adjustable-duration hold of the **Peak PPM** value may also be displayed.

Both Left/Right and Front/Surround "Phase"/Polarity LED indications are provided to alert of possible cancellation from mixdown in any likely playback situation.

To isolate possible faults, two rotary switches on the front panel let the operator route any one or pair of inputs independantly to left and right speaker channels for acoustic monitoring. A toggle switch is provided for mixing all six channels down to two for listening to all channels at once.

Features

- 2U high: highest fidelity in minimum rackspace
- Monitors SDI, AC-3 (Dolby Digital), and PCM or AES/EBU audio signals
- Simultaneous visual monitoring of all 6 channels
- 53-segment tri-color, wide-range, high-resolution LED bargraph level meters
- SDI, AC-3, and PCM or AES/EBU Status Indication LEDs
- Pro-16 signal select switch and indication LED
- Left/Right Front “phase" indicators
- Select any channel or pair of channels for isolated listening, or a stereo mixdown of all 6 channels
- Selected channel analog outputs on XLR connectors
- Headphone output

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Applications

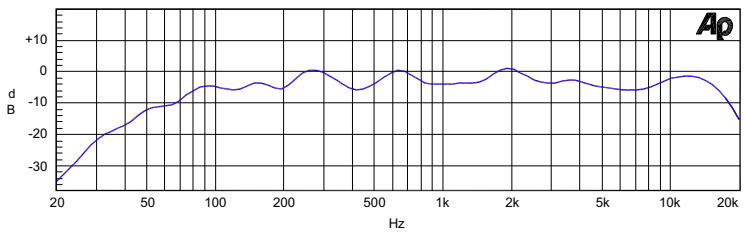
The **ATSC/DVB-3/SDI** is ideally suited for use in VTR bays, mobile production vehicles, teleconferencing installations, multimedia systems, satellite links and cable TV facilities, and on-air radio studios. Designed and manufactured in the U.S., the **ATSC/DVB-3/SDI** is backed by a strong warranty and a satisfaction guaranteed return policy.

General Specifications

Input Meter Dynamics:	Simultaneous VU (bar) and PPM (dot)
Peak Acoustic Output (@ 2 ft.):	104 dB SPL
Response, Sixth Octave:	70 Hz - 16 kHz ± 5 dB) (-10 dB @ 40 Hz, 20 kHZ)
Power Output, **RMS Each Side (4Ω):** **RMS Bass (4Ω):**	 20 W transient / 11 W continuous 36 W transient / 20 W continuous
Distortion, Electrical:	Less than 0.2% at any level below limit threshold
Distortion, Acoustic:	6% or less at worst case frequencies above 120 Hz, including cabinet resonance; typically less than 1.5%
Hum and Noise:	Better than -70 dB below full output
Magnetic Shielding:	Less than 1 Gauss any adjacent surface
Input Connectors:	Balanced: XLR
Power Consumption (Average Maximum):	60 W
AC Mains Input:	100-220VAC, 50-60 Hz
"ALL" Channel Summing Assignments*:	Left Side = LFront+LSurr+1/2Center+1/2LFE Right Side = RFront+RSurr+1/2Center+1/2LFE

* On special order, custom combinations of selected channels are available; either in lieu of, or in addition to, the regular selections.

Audio Response Curve



Typical 1/6 Octave Audio Response Curve

AC-3 Input Specifications

Input Impedance:	75Ω (ohm), unbalanced
Input Connectors:	BNC
Minimum Input level:	250 mV
Playback Mode:	"Line"

PCM and AES/EBU Input Specifications

Input Impedances/ Connectors:	BNC:75 Ω (ohm), unbalanced XLR:110 Ω (ohm) balanced
Conversion Data Width:	20 bit
Dynamic range:	95 dB
Frequency Response:	10 Hz - 20 kHz +/- 0.5 dB
Analog Output Distortion:	< 0.005%
Analog Outputs:	balanced, line-level (-20 dbfs=+4 dBu); minimum load impedance:10k Ω (ohm)

SDI Input Specifications

Input Impedance:	75Ω (ohm), unbalanced
Input Connector:	BNC
SDI Input Level:	400 - 1000 mV
Input Formats:	Componant, 525 or 625 lines with 48 kHz audio
Audio Sampling Rate:	48 kHz

Note: See pages 18-20 for additional technical specifications.

Physical Specifications

Weight:	18 lbs. (8.2 kg)
Dimensions (HxWxD):	3.5 x 19 x 12 inches (89 x 483 x 298 mm)

Units are designed to meet, at time of manufacture, all currently applicable product safety and EMC requirements, such as those of CE. 0 dbV ref. 0.775V RMS. Features and specifications subject to improvement without notice.

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Section 2

Operation

Installation

Front Panel Features

Rear Panel Features

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Installation

Mounting

NOTE: Be sure to set the Input Termination (accessed through the rear panel), BEFORE installing the unit into an enclosed rack or console. See **Item E**, page 14 for setting information.

The unit should be mounted where convenient for operating persons, ideally at approximately ear level for best high frequency response and eye level for best visual observation of the level meters. Its superior magnetic shielding eliminates concerns about locating it adjacent to most types of CRT monitors, including even high-resolution color monitors.

Heat Dissipation

Heat dissipated by the speaker amps is conducted directly to the left side of the chassis; no special considerations for cooling are necessary as long as the ambient temperature inside the rack area does not exceed approximately 40°C (104°F).

Sympathetic Vibration

Sympathetic vibration from other equipment (cables, etc.,) in the rack may be serious enough to interfere with the unit's sound quality out in the listening area. The use of thin card stock and/or felt or foam weather-stripping type materials between adjacent vibrating surfaces, or tying up loose cables, etc., may be required to stop vibrations external to the unit.

Mechanical Bracing

Even though the unit is fairly heavy, the chassis is securely attached to the front panel at eight points along its surface, not just at the four corners of the chassis ears. This feature will reduce or eliminate rear bracing requirements in many mobile/portable applications. The weight of internal components is distributed fairly evenly around the unit.

Audio Connections

Connection of the audio feeds is straightforward. Please refer to the system interconnect block diagram on page 21 for clarification of the general signal paths into and out of the **ATSC/DVB-3/SDI** unit.

Inputs are via either BNC or XLR connectors. BNC inputs are 75 Ω unbalanced; XLRs are 110 Ω balanced.

Electrical Interference

Care should be exercised to avoid mismatched cable types and other similar causes of undesired reflections in RF signal systems. If severe enough, such reflections can result in undesirable electrical interference in the audio signals.

As with any audio equipment, maximum immunity from electrical interference requires the use of shielded cable; however, satisfactory results can sometimes be obtained without it. The internal circuitry common is connected to the chassis.

AC Power

The unit's AC mains connection is via a standard IEC inlet, with safety ground connected directly to the unit's chassis. The universal AC input (100-240VAC, 50/60Hz) switching power supply is a self-resetting sealed type, with automatic over-voltage and over-current shutdown. There is no user-replaceable fuse in either the primary or secondary circuit.

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Front Panel Features

Please refer to **Figure-2a** on the following page to familiarize yourself with the front panel features of the **ATSC/DVB-3/SDI** unit. The following sections describe these features and are referenced, by number, to **Figure-2a**.

1 Speakers (Left/Middle/Right)

The **ATSC/DVB-SDI** internal speaker system is comprised of two mid-range tweeter speakers (*left* and *right*) and one woofer speaker (*middle*). The two side channel speakers reproduce, in stereo, only the mid and high frequencies. Please note that the woofer speaker (*middle*) is *not* a dedicated Center nor LFE speaker.

2 Speaker Select Switches (Left and Right)

Use the *left* switch to select any one of six selected channels for monitoring from the *left* speaker. Use the *right* switch to select any one of six selected channels for monitoring from the *right* speaker.

Note: These two switches are only functional when the **All/Selected Switch** (**Item 7**) is in the **SELECTED** position. These two switches are NOT functional when the **All/Selected Switch** is in the **ALL** position.

3 Speaker Select Disabled Indication LEDs (Left and Right)

When the **All/Selected Switch** (**Item 7**) is in the **ALL** position (thus *disabling* the **Speaker Monitor Select Switches**) both of these LEDs will glow RED.

4 Audio Level Meter LED Bargraph Displays (1-6)

Audio levels for source channels **1** through **6** are displayed via these six high-resolution 53-segment LED bargraph display level meters (three on the *left* side of the front panel; three on the *right* side). Dynamic range for these meters is 65 dB and they are able to display signal levels using both **PPM** and **VU** standards. An adjustable-duration hold of peak **PPM** value may also be displayed. Each meter is labeled according to the standard Surround Sound nomenclature (left front, right front, center, low frequency effects, left surround, and right surround). See page **20** for more information about these level meters.

5 Bargraph Brightness Trim Pot (Left and Right)

These two trim pots are recessed into the front panel and can be accessed using a small screwdriver. Turning either trim pot *clockwise* will increase the relative brightness of the associated bargraph display LED segments. The *left* trimpot affects the *left* three bargraph displays (**1**-**3**); the *right* trim pot affects the *right* three bargraph displays (**4**-**6**).

6 Input Source Select Switch

This 2-position toggle switch allows the operator to choose between two possible input sources (**1-AES** or **2-SDI**) for monitoring through the unit. Choosing **1-AES** selects the **AC-3** *or* **PCM/AES** signals entering the **Source 1** connectors on the rear panel (See **Items C** and **D**, page 14). Choosing **2-SDI** selects an **AC-3** or **PCM/AES** source that is de-embedded from the **SDI** signal entering the **Source 2** connector on the rear panel (see **Item F**, page 14).

7 All/Selected Switch

When this 2-position toggle switch in in the **ALL** position, a stereo mixdown of the five full channels is applied to the speaker amps (the LFE channel is excluded). In this posiotion both the *left* and *right* **Speaker Select Switches** (**Item 2**) are disabled and the **Speaker Select Disabled Indication LEDs** (**Item 3**) will glow RED.

When this switch is in the **SELECTED** position, channel selection defaults to the settings as selected by the *left* and *right* **Speaker Select Switches** (**Item 2**) and the *left* and *right* **Speaker Select Disabled Indication LEDs** (**Item 3**) will be unlit.

8 SDI Group Select Switch (1, 2, 3, or 4)

This 4-position rotary switch allows the operator to choose **SDI GROUP 1**, **2**, **3**, or **4** for monitoring. The ***Subgroup*** (**1** or **2**) of each **SDI GROUP** is selected using the **SDI Subgroup Select Switch** (**Item 17**, page 12).

Note that the **Input Source Select Switch** (**Item 6**) must be set to **2-SDI** in order for the selected **SDI** signals to be actively monitored.

9 Volume Control Pot

This controls the loudness of the audio reproduced by the internal speakers or connected headphone. Clock-wise rotation of this control increases the loudness of the monitored audio.

(Continued)

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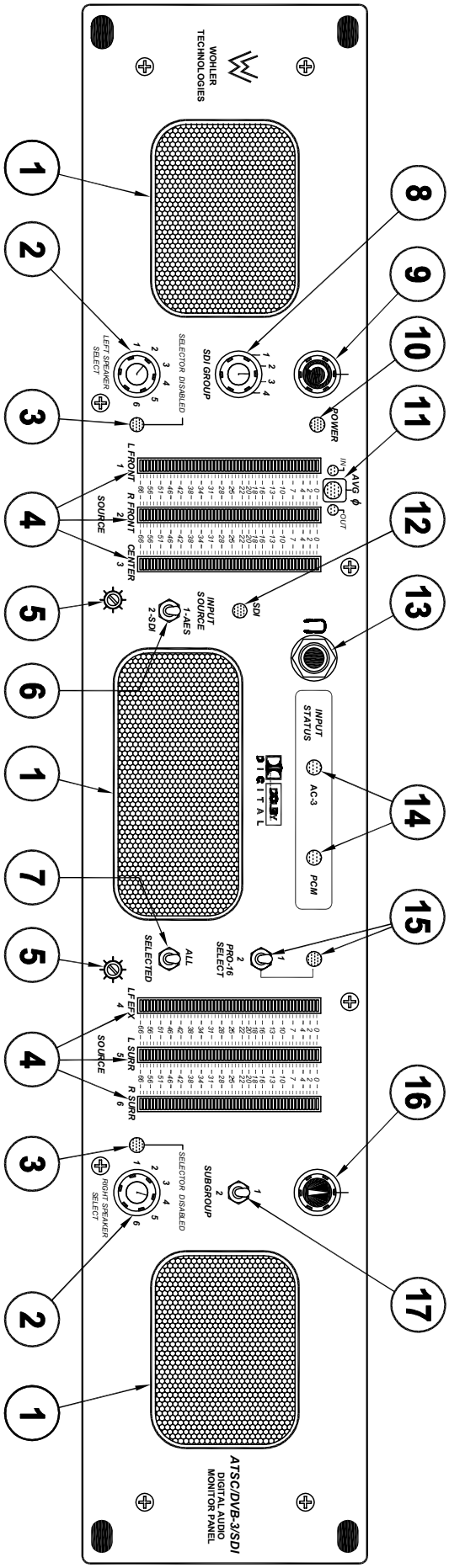

Figure-2a: Front Panel Features

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Front Panel Features

(Continued)

10 Power Indication LED

This LED signals the operating condition of the power supply. The LED glows GREEN to indicate the unit is connected to mains power and an operation voltage is present.

11 Phase Indication LEDs

These three LEDs offer instant verification of phase (polarity) conditions in the pair of channels selected for monitoring in the *left* and *right* channel speakers. There are three LEDs; two smaller LEDs (labeled **IN** and **OUT)** on either side of a larger LED (labeled **AVG)**. The small **IN** and **OUT** LEDs show instantaneous phase relationships in the signal, while the larger **AVG** LED indicates the *average* phase condition. The small **IN** LED on the *left* glows (or blinks) GREEN when signals are *in-phase*. The small **OUT** LED on the *right* glows (or blinks) AMBER for *out-of-phase* signals. The large **AVG** LED indicates the *average* phase condition by glowing GREEN for *in-phase* conditions, or RED for *out-of-phase* conditions. In general, it is sufficient to regard the **AVG** LED (*average* phase condition) as adequate for proper phase monitoring. While it is normal for stereo signals to contain some intermittant instanateous out-of-phase and in-phase conditions (small LEDs), a steady RED glow of the larger LED almost always indicates an out-of-phase alarm condition.

12 SDI Signal Status Indication LED

This LED will indicate the status of any SDI signal entering **Source 2** regardless of any monitor selection settings. This LED shows the following conditions:

- **OFF:** No valid SDI signal present.
- **GREEN:** Valid SDI signal is present.
- **RED:** SDI signal not properly received.

13 Headphone Jack

Select the headphone audio sources as you would for the internal speakers. When you plug in headphones, the speakers will mute. This jack accepts a standard 1/4” phone type stereo plug.

14 Input Status Indication LEDs (AC-3 and PCM)

These two green LEDs indicate which kind of signal is being received at the **Source 1** inputs. When an **AC-3** signal is being monitored from **Source 1** inputs, the *left* **AC-3** LED will glow GREEN. When a **PCM** or standard **AES/EBU** signal is being monitored from the **Source 1** inputs, the *right* **PCM** LED will glow GREEN.

15 Pro-16 Selection Switch anf Indication LED

In the event that you are processing two different **Dolby Digital Pro-16** data streams it is possible to select between the two with this toggle switch. The LED will glow AMBER if such signals are present. In the absence of such data streams, the LED will *not* be lit and the switch will be nonfunctional.

16 Balance Control Pot

This control pans the volume balance between the *left* and *right* speakers.

17 SDI Subgroup Select Switch (1 or 2)

This 2-position toggle switch allows the operator to choose whether the unit will monitor ***Subgroup* 1** or ***Subgroup* 2** of the chosen **SDI Group** (**1**, **2**, **3**, or **4**) as selected by the **SDI Group Select Switch** (**Item 8**, page 10). **Subgroup** selection chooses the channels to be monitored from the selected **SDI Group** as follows:

Subgroup 1 = Channels 1 and 2

Subgroup 2 = Channels 3 and 4

Note that the **Input Source Select Switch** (**Item 6**) must be set to **2-SDI** in order for the selected SDI signals to be actively monitored.

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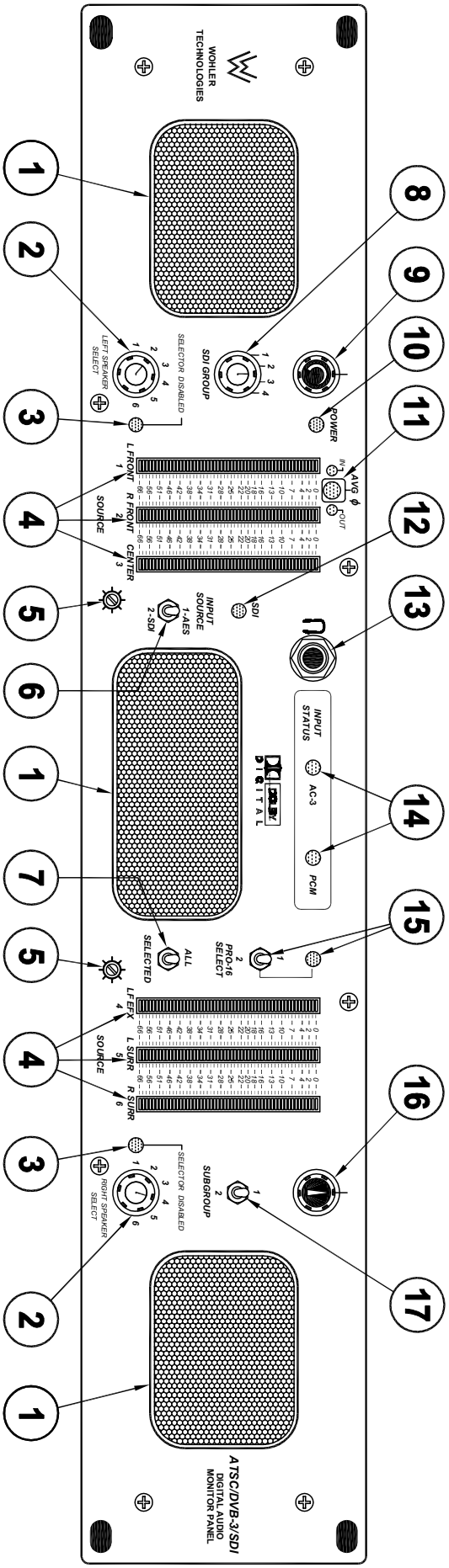

Figure-2a: Front Panel Features

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Rear Panel Features

Please refer to **Figure-2b** on the following page to familiarize yourself with the rear panel features of the **ATSC/DVB-3/SDI** units. The following sections describe these features and are referenced, by letter, to **Figure-2b**.

A Power Connector

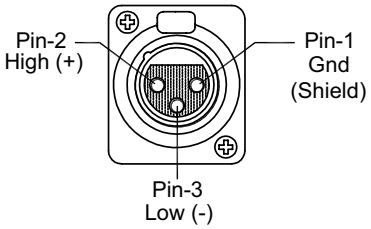
Attach the supplied IEC-320 power cord between this connector and mains power (**100 - 240VAC nominal, 50/60 Hz**). The front panel **Power Indication LED** (**Item 10**, page 12) will glow GREEN to indicate operating voltages are present.

B Option DIP Switch Module

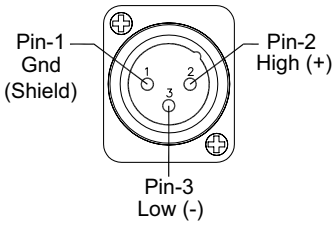
This DIP switch is reserved for possible options still to be determined. You may disregard its settings.

C Source 1 Input and Loop-Through Connectors (XLR)

The **SOURCE 1** XLR input is meant to receive either **AC-3** (Dolby Digital®) or standard **PCM** or **AES** signals. Both XLR connectors are configured for a *balanced* connection (110 Ω impedance). The **IN** XLR connector is a 3-pin female. The **LOOP** XLR connector is a 3-pin male. For pinout information see diagram below.



XLR, 3-Pin Female
INPUT Pinout



XLR, 3-Pin Male
OUTPUT Pinout

D Source 1 Input and Loop-Through Connectors (BNC)

The **Source 1** BNC input is meant to receive either **AC-3** (Dolby Digital®) or standard **PCM** and **AES/EBU** signals. Both the **IN** and **LOOP** BNC inputs are configured for an *unbalanced* connection (75 Ω impedance).

E Termination DIP Switch Module

In the event that signals entering the **Source 1** inputs (**Item C** and **D**) are connected to downstream equipment, then DIP switch section **1** of this module should be set to UNTERMINATED (**UP**). If there is *no* connection to downstream euipment, then section **1** should be set to TERMINATED (**DOWN**). **Note:** Section **2** of this DIP switch is *not* functional in the **ATSC/DVB-3/SDI** model.

F Source 2 Input and Output Connectors (BNC)

The BNC **IN** connector is meant to receive standard **SDI** signals. The BNC **OUT** connector outputs a reclocked (regenerated) copy of the signal entering the input. Both connectors are configured for *unbalanced* connections (75 Ω impedance).

G Selected Output (Analog) Connectors (Chan.A/Left and Chan.B/Right)

These two 3-pin male XLR connectors are **Analog** outputs of the input signals as selected for active monitoring through the *left* and *right* speakers (or headphones). The *left* **CH.A(L)** connector outputs the *left* speaker channel (channel **A**) and the *right* **CH.B(R)** connector outputs the *right* speaker channel (channel **B**). Both connectors are configured for low impedance connections and the output signals are *not* affected by the **Volume** and **Balance** controls or **Headphone Mute** feature. For XLR connector pinout information, see the diagram under **Item C**, above.

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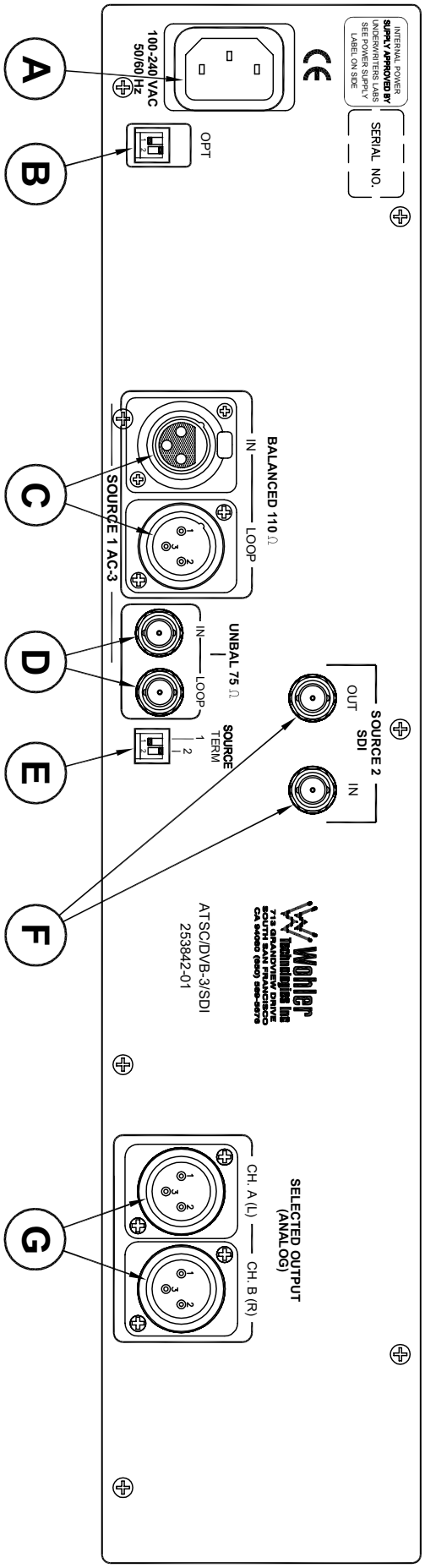

Figure-2b: Rear Panel Features

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Section 3

Technical Information

- General Technical Observations
- SDI to AES/EBU PCB (919096) Description
- Level Meter Specifications
- ATSC/DVB-3/SDI Interconnect Block Diagram

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General Technical Observations

General Mechanical Observations

Elimination of cabinet and component sympathetic vibrations (resonances) requires considerable attention to mechanical details. Because of this, and the physical constraints of the speaker's acoustic enclosures, even minor changes to any of the mechanical details of the unit can seriously impair its acoustic performance. This especially applies to the speaker baffles. If mechanical work on the unit is necessary, be sure to make adequate notes to permit accurate reassembly.

Unfortunately, the unusual and wholly proprietary method of magnetic shielding is usually degraded slightly by any disassembly of the unit, except removal of the rear panel. Almost any maintenance or repair will require removal of the cover. If an immediately adjacent video monitor shows magnetic interference after reassembly of the unit, it must be returned to the factory to restore the shielding completely.

General Audio Circuitry Observations

Since a single-sided power supply is used, all amplifier sections are "biased" with a 1/2 supply reference, so all opamp signal terminals on the main board should have a DC level of +12V, +/-0.7V. Signal inputs to the main audio board from any of the input select circuits are via the balanced input stage, in lieu of the XLR analog inputs on the basic unit. Signal feed points for level meters and the phase indicator are immediately after the input stage, and before the volume control section. The signal pick-off for the headphones is after the volume and balance controls. Speaker muting is controlled by circuitry that senses connection of headphones to the jack.

The power amps are attached to an aluminum heatsink plate (which is also connected to the circuit common for these devices). The heatsink plate forms an operational module separate from the chassis, which allows access to the solder side of the circuit board while power is applied to the circuitry. To avoid thermal shutdown of the power amp(s), they should NOT be operated without their tabs being fastened to the heatsink plate.

Variations in the frequency response of different production runs of drivers sometimes requires minor adjustments in the equalization/crossover components in individual runs of units. Some of these components may have values slightly different than those indicated in the schematic, which are the nominal ones. If any of the drivers (speakers) are replaced, it may be helpful to change some of these components to achieve maximum flatness of response.

The operating threshold of the woofer limiter is critical to both satisfactory reproduction of musical transients and preventing damage to, or destruction of, the speaker itself. The side speaker output limiter circuits are similarly important, though not as critically adjusted.

The woofer power amps are arranged in a bridge configuration; care must be taken to avoid letting EITHER speaker terminal contact the chassis (common) OR THE GROUNDED LEAD OF ANY TEST EQUIPMENT so as not to short out the power amps. The side speaker outputs are single-ended, so these precautions are not necessary for them.

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SDI to AES/EBU PCB (919096) Description

The Serial Digital Interface (**SDI**) to **AES/EBU** Converter PCB (**919096**) allows selected Wohler Technologies audio monitoring systems to be connected directly to an **SDI** video signal containing embedded audio. Two levels of component signals (eg., D1, D5, and Digi Betacam type) are currently supported; synchronous audio at 48 KHz with either 20-bit data packets or audio and extended data packets.

In the **ATSC/DVB-3/SDI** model, the **919096** demultiplexes (extracts) the audio data from the video data, reformatting it to the **AES/EBU** standard which is then processed by the **ATSC Digital Decoder** PCB (**919129**) converting the **AES/EBU** signal to **Analog** audio.

A front panel 4-position *rotary* switch selects between **SDI Group 1**, **2**, **3**, or **4**. A front panel 2-position *toggle* switch selects channels **one** and **two** (*first* subgroup) or channels **three** and **four** (*second* subgroup) from whichever **SDI Group** is selected for demuxing.

919096 Specifications

Input characteristics:	75 Ohm (BNC), AC coupled, 15 dB minimum return loss, 10-270 MHz
Receiver type:	Auto equalizing with clock regeneration
Sensitivity performance:	Tolerates cable loss of at least 30 dB @ 135 MHz
SDI input level:	400 - 1000 mV
Input formats:	Component, either 525 or 625 lines w/ 48 KHz audio
Audio sampling rate:	48 KHz
SDI output type:	Fully regenerated copy of SDI input signal (equalized and regenerated, scrambled NRZI)
SDI output:	15 dB minimum return loss, risetime 0.75-1.5 ns (20-80%)
SDI output level:	800 mV +/-10%
AES from SDI output level:	75 Ω (BNC) unbalanced, risetime 5-30 ns (10-90%)
AES data bits:	20
Error Indication:	Bi-color LED (red/green) Off = no signal Green = signal present Red = Error

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Level Meter Specifications

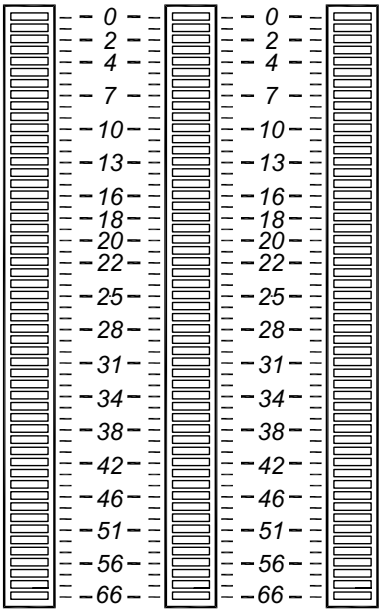
Description

The 53-segment type of tri-color LED bargraph display has a total length of 2.24" (56.8 mm) and uses relatively small segments. This high resolution segment size is easy to accurately visually monitor for distances up to six feet (1.8 meters). Segment size is 0.158" (4 mm) x 0.04" (1 mm). Segment pitch is 0.039" (0.99 mm).

Each LED bargraph display section visually indicates the dynamic changes within the audio signal source(s) being monitored. All bargraph LED segments are of the tri-color type (green, amber, red). Ballistics for these meters are factory set to display a single floating **PPM 'dot'** (continuous decay of 20 dB in 1.5 seconds) above a **VU bar**; each segment's color being fixed according to its position on the scale. Level gain is factory set at +4 dBu. Dynamic range for these meters is 65 dB.

Scales

Please refer to the figure below for an illustration showing the standard scale for the 53-segment bargraph display used in the **ATSC/DVB-3/SDI** digital audio monitor. Custom variations of this scale are also available by special order.



LED Bargraph Level Meter Specifications

Level meter type:	LED bargraph
Segment quantity:	53
Level Meter Scale:	0 to -66 dB
Dynamic Range:	65 dB
Midscale Resolution:	1 dB
Bargraph Length:	2.22" (56.4 mm)
LED segment size:	0.14" x 0.028" (3.57 x 0.7 mm)
LED segment pitch:	0.041" (1.05 mm)
Segment display color:	Tri-color (red, amber, green)
Peak emission wavelength:	Green: 570 nm, Red: 630 nm
Segment brighness, (If = 20 mA):	3.5 mcd
Segment brightness, uniformity:	<10% difference between segments
Adjacent segment "Off" brightness:	<1% of brightness of active segment

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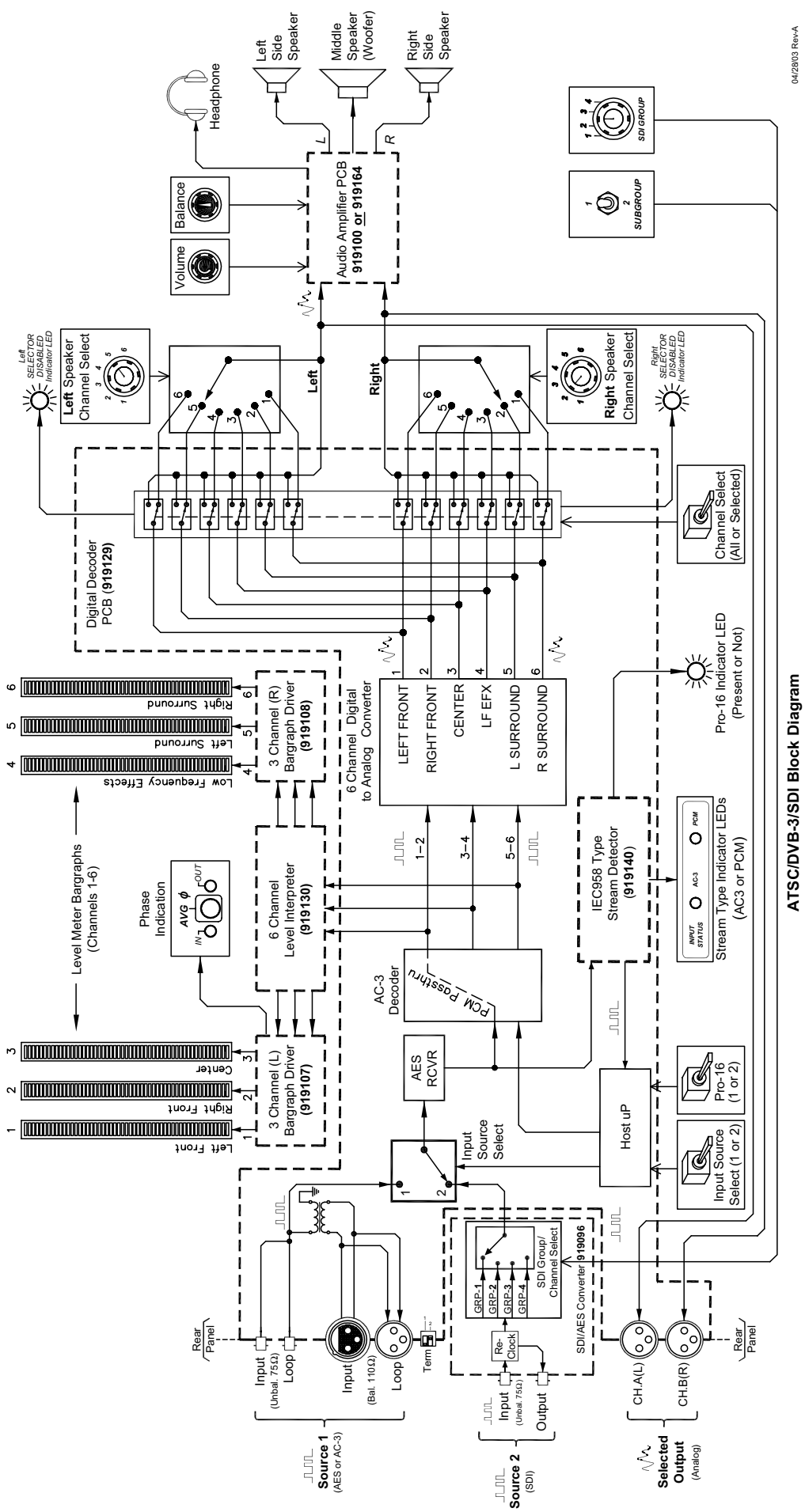
ATSC/DVB-3/SDI Interconnect Block Diagram



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NOTE:
PCB layout and schematic support documentation is available upon request.

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